

## **SECTION 410 BITUMINOUS SURFACE TREATMENT**

**410.01 DESCRIPTION.** This work is applying one or more coats of bituminous material on a prepared aggregate roadway surface, covering each application with aggregate surfacing material.

### **410.02 MATERIALS.**

**410.02.1 Bituminous Material.** Furnish the specified bituminous material under Section 702.

**410.02.2 Aggregate.** Furnish the specified aggregate under Section 701.

### **410.03 CONSTRUCTION REQUIREMENTS.**

**410.03.1 Equipment.** Maintain the following equipment on the project throughout the work.

**A. Distributor.** One pressure distributor for bituminous material with a minimum 1,000-gallon (3785 L) capacity insulated tank, internally heated.

Equip the distributor with a full-circulating spray bar:

1. At least 9 feet (2.8 m) long;
2. Capable of 1 foot (305 mm) incremental length adjustments up to 16 feet (4.9 m);
3. Having vertical nozzle adjustment that conforms to the roadway crown;
4. Capable of lateral shifting of the entire spray bar while operating;
5. With vertical height adjustment capable of maintaining a preset height above the road surface.

Use spray bars and flat-slotted nozzles designed to not clog during intermittent operation and provide positive cutoff of the bituminous material. Use positive-acting flow control valves to produce a uniform, unbroken spread of bituminous material.

Remove or repair distributors not uniformly distributing the bituminous material.

Assure the distributor has devices and charts to provide for accurate, rapid determination and quantity control of the bituminous material application.

Equip the distributor with a pressure pump, pressure gauge, thermometer well, thermometer, and a calibrated fluid content gauge.

Use pneumatic-tired distributors meeting legal load requirements.

**B. Rollers.** Furnish pneumatic tired rollers under Subsection 210.03.4(D).

**C. Aggregate Spreader.** Provide one self-propelled aggregate spreader:

1. Equipped with at least 4 pneumatic tired wheels on 2 axles;
2. Capable of uniformly spreading the material over the full width of the bituminous material;
3. The spreader application rate being independent of motive power.

- D. Cleaning Equipment.** Use power brooms, blowers, or hand brooms.
- E. Watering Stockpiles.** Provide equipment for wetting the cover aggregate stockpiles, when required.
- F. Watering Equipment.** Furnish water distributing equipment meeting the applicable requirements of Subsection 210.03.5.
- G. Scales.** Furnish scales under Subsection 301.03.2(C).

**410.03.2 Existing Surface Preparation.** Unless surface preparation is included in the contract surfacing item, perform the work under Section 204, as modified or supplemented below.

When required, apply a light, uniform water application to the roadway surface just before applying the bituminous material. Do not exceed 3% moisture by weight in the top 2-inches (50 mm) of the aggregate course.

When required, apply a prime coat of bituminous material at the rate directed before the initial application of bituminous surface treatment. Apply the prime coat under Section 407.

**410.03.3 Sweeping.** Clean the roadway surface of all dust, dirt, and foreign material before applying the bituminous material.

**410.03.4 Application of Bituminous Material.** Apply the bituminous material with a maximum allowable variation of 0.02 gallon per square yard (0.4 L per m<sup>2</sup>) from the specified application rate.

Apply bituminous material only with the Project Manager's approval. Apply the material when the surface temperature is at or above 60 °F (16 °C).

Do not work when rain, wind, or temperatures would prevent obtaining the specified results.

Uniformly apply the bituminous material at the temperature and rate specified. Provide uniform surface cover and true lines.

Assure high viscosity bituminous materials are covered with aggregate within 5 minutes.

Apply bituminous material to produce smooth and consistent transverse and longitudinal joints in successive applications with the adjacent completed surfaces.

Longitudinal joints may be from 6 to 10-inches (150 to 255 mm) wide but not overlap at the application ends. Prevent lapping at transverse joints by inserting a drip pan under the nozzles if necessary. Before continuing the application, spread protective sheets over the treated surface on the cover aggregate to provide bituminous coverage at the joint.

Apply the material to keep meet lines to a minimum.

The Project Manager may approve full width application of bituminous material and cover aggregate in a single, continuous operation.

Re-apply bituminous material at joints where the uncovered bituminous material has set and will not bond the aggregate at Contractor expense.

**410.03.5 Application of Cover Aggregate.** When directed, water the stockpiled cover aggregate before spreading it on the bituminous material.

Cover the first bituminous material application within 60 minutes. Uniformly cover all bituminous material with cover aggregate at the specified rate. When directed, use brooms to uniformly distribute the cover aggregate. Avoid displacement or loosening of the cover aggregate.

Do not permit haul trucks and traffic to drive on any uncovered bituminous material. Furnish traffic control for fresh spread cover aggregate areas as specified in the traffic control plan.

Before applying the adjacent bituminous material, broom all joints the full width to remove loose aggregate.

**410.03.6 Rolling.** Roll the cover aggregate immediately after spreading within 30 minutes of spreading.

Use self-propelled pneumatic-tired rollers with a ground contact pressure of between 50 psi (345 kPa) and 95 psi (656 kPa). Provide 2 rollers for each aggregate spreader used.

Roll parallel to the centerline; starting on the low side of the lane and working towards the crown or high side. Overlap roller passes at least 6-inches (155 mm).

Continue rolling until a smooth, compacted surface is produced.

Avoid displacing or loosening the cover material while rolling.

**410.03.7 Curing and Cleaning.** When the rolling is completed on each surface course and the surface is accepted, it may be opened to traffic.

Allow the surface to cure for at least 5 days.

Repair all surface defects in the treated surface immediately with the specified bituminous material or use a pre-mix bituminous aggregate at Contractor expense.

Cover areas of excess bituminous material with aggregate and roll at Contractor expense.

When the Project Manager determines the first course of bituminous material and cover aggregate has cured and set, all repairs have been accepted, all excess cover aggregate is removed, clean the surface of dirt, dust, and foreign materials.

Begin construction of the succeeding course on the cleaned surface.

**410.03.8 Completion.** When the final course is complete, open the surface to traffic for 3 days, using the specified traffic control. During this time, broom and roll the surface as required.

Repair all surface defects under Subsection 410.03.7.

Cover all areas exhibiting excess bituminous material with aggregate and roll it.

**410.03.9 Protection of Traffic and Highway Structures.**

**A. Traffic Control.** Furnish traffic control meeting the contract requirements and Section 618.

**B. Structure Protection.** Cover exposed bridge elements, culverts, curbs, gutters, guard fences, road signs, and other roadside structures to protect them from splash or spray when applying bituminous material.

Clean these same items of all bituminous material, dirt, or other material caused by the Contractor's operations.

Repair all Contractor caused damage to the highway or structures at Contractor expense.

**410.04 METHOD OF MEASUREMENT.**

**410.04.1 Bituminous Material.** Bituminous material is measured by the gallon (Liter) or the ton (metric ton) under Subsection 402.04.

**410.04.2 Cover Aggregate.** Cover aggregate is measured by the ton (metric ton) or the cubic yard (cubic meter) measured in the vehicle at the point of delivery on the roadway, as specified in the Contract and under Subsection 301.04.1.

**410.04.3 Traffic Control.** Traffic control is measured under Subsection 618.04.

**410.04.4 Existing Surface Preparation.** Where base construction is a part of the Contract with bituminous surface treatment, the items of work for existing surface preparation are incidental to and included in payment for the base construction.

Where bituminous surface treatment is applied to an existing aggregate surface, the work for existing surface preparation is measured for payment under Subsection 204.04.

**410.04.5 Rolling and Watering.** Rolling and watering are incidental to other items of the Contract and not measured for payment.

**410.05 BASIS OF PAYMENT.** Payment for the completed and accepted quantities is made under the following:

<b><u>Pay Item</u></b>	<b><u>Pay Unit</u></b>
Bituminous Material	Gallon (liter) or Ton (metric ton)
Cover Aggregate	Cubic Yard (cubic meter) or Ton (metric ton)
Traffic Control	See Subsection 618.05

Surface sweeping or cleaning, watering of aggregate stockpiles and the roadway surface, repairing damaged surfaces or surfaces with excess bituminous material, and protection and repair of structures specified in Subsection 410.03.9(B) are incidental to and included in payment for other items of the Contract.

**410.05.1 Existing Surface Preparation.** Existing surface preparation, when specified, is paid under Subsection 204.05.

When not specified in the Contract, the existing surface preparation work is incidental to and included in the payment for the base construction.

Payment at the contract unit price is full compensation for all resources necessary to complete the item of work under the Contract.